

SHORT COMMUNICATION

DESCRIPTION OF THE EGG SAC OF *MIMETUS NOTIUS* (ARANEAE, MIMETIDAE) AND A CASE OF EGG PREDATION BY *PHALACROTOPHORA EPEIRAE* (DIPTERA, PHORIDAE)

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ABSTRACT. The eggsac of the pirate spider, *Mimetus notius*, is described and compared with eggs of other members of the genus. The phorid fly egg predator, *Phalacrotophora epeirae*, was reared from a *M. notius* eggsac.

Keywords: *Mimetus notius*, egg sac, *Phalacrotophora epeirae*, predation

Members of the family Mimetidae have justifiably earned the common appellations of "assassin" and "pirate" spiders because of their interesting feeding habits. Armed with a series of long, slightly curved spines on the promarginal areas of the tibiae and metatarsi of legs I and II (Kaston 1981), they enter spider webs, especially those of comb-footed spiders (Theridiidae) and orbweavers (Araneidae), and prey upon the occupants (Gertsch 1979). Jackson & Whitehouse (1986) observed mimetids using vibratory aggressive mimicry to lure spiders within striking range.

Although these spiders are poorly represented in systematic collections, a recent survey of the genus *Mimetus* Hentz 1832 in Kansas has revealed the presence of four species (Guarisco & Mott 1990). *Mimetus notius* Chamberlin 1923 is the second most commonly encountered member of the genus in northeastern Kansas. It has been taken in sweep samples of understory vegetation, mostly coralberry (*Symporicarpus orbiculatus* Moench.), in woodland on the Fitch Natural History Reservation (FNHR) and on the eaves and outer walls of Reservation Headquarters (FNHR) in Douglas County, Kansas. The FNHR is a 590 acre (239 ha) tract of land which comprises all but the southwestern 50 acres (20 ha) of Section 4 (T12S, R20E) in Douglas County. It is located at the ecotone between the Eastern Deciduous Forest and Tallgrass Prairie Biomes, and ranges from 880–1080 feet (268–329 m) in elevation (39°00', 95°11') (Fitch & Kettle 1988). Two

adult females were collected from eastern red cedar (*Juniperus virginiana* L.) in Montgomery and Greenwood counties, on 4 and 26 May 1991, respectively.

The egg sac of *M. notius* is fluffy, translucent, spherical to subspherical, and is composed of a 1 mm thick outer layer of sparse, curly, brown silk strands surrounding a dense white central section containing the brown eggs. Completely surrounding the egg sac is a thin, subspherical to elliptical net of silk. The egg sac is suspended within this net by several thick silk strands which extend from the sac to the net (Fig. 1). The shape of the net appears to be determined by the amount of space available near the egg sac. Two sacs, each laid within the confines of a petri dish, were surrounded by elliptical silk nets, 30 × 23 and 50 × 20 mm in diameter. Each net was 15 mm in height, which equalled the height of the petri dish. An egg sac discovered on the underside of a wooden door leaning against the outer wall of a laboratory building on the FNHR had a silk net with the following dimensions: 30 × 30 × 7 mm. Several egg sacs located in the corners between the eaves and outer walls of buildings possessed nets with similar dimensions.

A female collected on 4 May produced an egg sac 7 × 5 mm on 16 May containing 24 eggs. On 26 May, this individual produced a second egg sac (6 × 8 mm) containing an undetermined number of eggs. A second female obtained on 26 May produced a total of 5 egg sacs during the following four weeks. The first

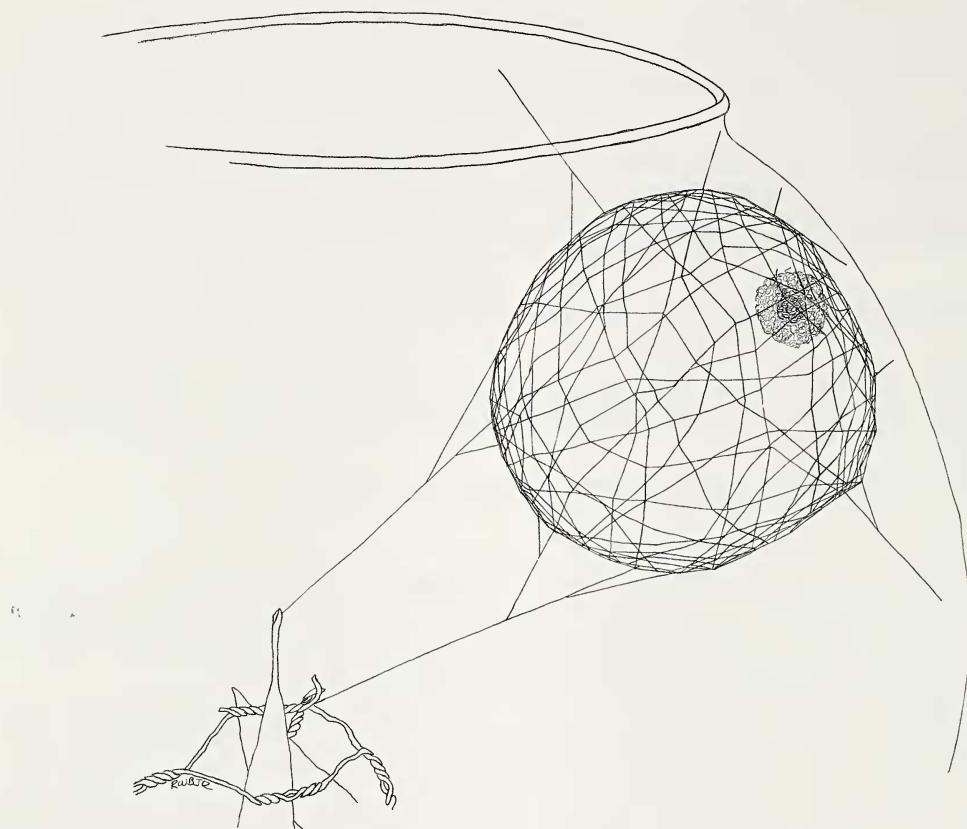


Figure 1.—*Mimetus notius* egg sac.

two egg sacs were laid on 28 May and 6 June, were 6×6 and 5×6 mm in diameter, with surrounding nets 20 and 25 mm in diameter, and contained a total of 29 and 37 eggs, respectively. The last three sacs were laid on 13, 21 and 27 June and contained 21, 12, and 25 eggs, respectively. These sacs were laid in a small vial, and the silk nets surrounding them were 15×25 mm. The last two egg sacs were probably infertile because they became covered with mold in a few days.

Observing the structure of egg sacs produced in the laboratory enabled me to recognize them in the field. One egg sac discovered on the FNHR on 18 June yielded 47 spiderlings ten days later. An egg sac collected from the eaves of a building in the Topeka Zoo on 21 June produced 35 spiderlings and one infertile egg on 4 July. Two egg sacs collected from the eaves of a residence in Lawrence, Douglas County, on 13 August contained 14 empty shells and 12 infertile eggs, and 25 empty shells and 7 infertile eggs, respectively.

The average number of eggs per sac = 28.9, SD = 9.71 ($n = 10$).

On 3 July, I collected a *M. notius* egg sac from the eaves of a house in Jefferson County, Kansas which contained several brown phorid fly pupae. Two days later, an adult fly, *Phalacrotophora epeirae* (Brues 1902) (Diptera, Phoridae), emerged from the egg sac. The remaining flies matured over the next few days.

The structure of the egg sac of *M. notius* resembles those of other members of the genus, except for the unique net of silk which surrounds it. *Mimetus puritanus* Chamberlin 1923 and *M. hesperus* Chamberlin 1923 both construct spherical, bright orange, loosely woven egg sacs (Guarisco & Mott 1990; Icenogle 1972). Lawler (1972) described the egg sacs of both wild and captive *M. eutypus* Chamberlin & Ivie 1935. They were loosely woven and those produced in captivity ranged from white to dark rust-brown, while the wild egg sacs were all pale yellow-white. The egg sacs of Old World mimetids are generally globular

with many loops of silk on the surface and contain only 5–20 eggs (Heimer 1986). The tufted nature of the silk may protect the eggs from mechanical damage, predation, or parasitism. Although it is tempting to speculate upon the probable functions of the unique structure of the egg sac of *M. notius*, further observations are needed to explore the relationships of various aspects of egg sac design and relative survivability.

The present observation on the emergence of *Phalacrotophora epeirae* from an egg sac of *M. notius* is the first recorded instance of egg predation or parasitism upon any member of the genus *Mimetus*. *Phalacrotophora epeirae* is a well known larval egg predator which has been reared from spider egg sacs of the following species: Linyphiidae: *Pityohyphantes costatus* (Hentz 1850) (see Manuel 1984); Araneidae: *Larinoides Caporiacco* 1934 (= *Nuctenea* Simon 1864 = *Epeira* Walckenaer 1805) sp. (see Brues 1902, 1903), *Larinoides sclopetarius* (Clerck 1757) (see Auten 1925), *Gasteracantha cancriformis* (Linnaeus 1785) (see Muma & Stone 1971); and Salticidae: *Phidippus audax* (Hentz 1845) (see Jones 1940).

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